Unit 15
Day 6

Descartes' Rule of signs:

Let f(x) be a polynomial with real coefficients and terms in descending degree order:

a) the number of positive real zeros of f(x) either is equal to the number of variations in signs occuring in the coefficients of f(x), or else is less then the number of variations decreased by a positive even integer.

b) the number of negative real zeros of f(x) either is equal to the number of variations in signs occuring in the coefficients of f(-x), or else is less than the number of variations decreased by a positive even integer.

Note - Polynomial must be written in descending degree and missing terms are not counted as a change in signs!

Ex1: $f(x)= x^4-3x^3+2x-7$

# of distinct zeros 4
# of positive real zeros 3, 1
# of negative real zeros 1
# of complex zeros 0, 2

$f(-x)=(-x)^4-3(-x)^3+2(-x)-7$

$f(x)= x^4+3x^3-2x-7$

Ex2: $f(x)=2x^3+6x^2+5x-2$

# of distinct zeros 3
# of positive real zeros 1
# of negative real zeros 2, 0
# of complex zeros 0, 2

$f(-x)=2(-x)^3+6(-x)^2+5(-x)-2$

$f(x)=-2x^3+6x^2-5x-2$

Wksht 1-8 all & pg 301 67-72 all